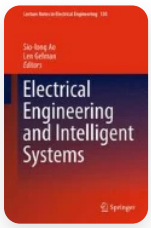
SPRINGER NATURE Link

Log in

Computations of Price Sensitivities After a Financial Market Crash

| Chapter | First Online: 01 January 2012

| pp 239–248 | Cite this chapter



Electrical Engineering and Intelligent Systems

Youssef El-Khatib & Abdulnasser Hatemi-J

Part of the book series: Lecture Notes in Electrical Engineering ((LNEE,volume 130))

1767 Accesses **8** Citations

Abstract

Several new approaches have been recently suggested in the literature for the computation of the price sensitivities of financial assets. However, there is lack of studies that investigate this issue during financial crises. It is a well-known fact that the volatility increases significantly during financial crises. This increased volatility is naturally going to affect the underlying option pricing, the price sensitivities and consequently the management of the underlying risk. It is especially during the crises that the investors require to have access to precise calculations in order to deal with the increased level of risk. This issue is especially relevant due to the globalization. Thus, to compute the price sensitivities in such a scenario is crucial. This paper is the first attempt to the best knowledge to address the computation of price sensitivities after a financial

market crash occurs. Our method to tackle the problem is based on Malliavin calculus.

This is a preview of subscription content, log in via an institution to check access.

Access this chapter

Log in via an institution

Subscribe and save

Springer+ from €37.37 /Month

- Starting from 10 chapters or articles per month
- Access and download chapters and articles from more than 300k books and 2,500 journals
- Cancel anytime

View plans

Buy Now

Chapter EUR 29.95
Price includes VAT (Poland)

- Available as PDF
- Read on any device
- Instant download
- Own it forever

Buy Chapter

eBook EUR 85.59
Price includes VAT (Poland)

- Available as EPUB and PDF
- Read on any device
- Instant download
- Own it forever

Buy eBook

Softcover Book EUR 106.99
Price includes VAT (Poland)

- Compact, lightweight edition

Hardcover Book EUR 106.99
Price includes VAT (Poland)

- Durable hardcover edition

Free shipping worldwide - view details

Buy Softcover Book →

Free shipping worldwide - view details

Buy Hardcover Book →

Tax calculation will be finalised at checkout

Purchases are for personal use only

Institutional subscriptions →

Explore related subjects

Discover the latest articles, books and news in related subjects, suggested using machine learning.

Mathematics in Business, Economics and Finance | Capital Markets | Computational Economics | Financial Economics | Financial Crises | Mathematical Finance | Financial Market Dynamics and Volatility Analysis

References

1 Black F, Scholes M (1973) The pricing of options and corporate liabilities. J Polit Econ 81:637–654

2 Deeba E, Dibeh G, Xie S (2002) An algorithm for solving bond pricing problem. Appl Math Comput 128(1):81–94

3 Baillie RT, Dibeh G, Chahda G (2005) Option pricing in markets with noisy cyclical and crash dynamics. Finance Lett 3(2):25–32

4 Dibeh G, Harmanani HM (2007) Option pricing during post-crash relaxation times. Phys A 380:357–365

5 El-Khatib Y, Hatemi-JA (2011a) On the price sensitivities during financial crisis. In: Proceedings of the world congress on engineering 2011. Lecture notes in engineering and computer science, WCE 2011, London, U.K., 6–8 July 2011, pp 401–404

6 El-Khatib Y, Hatemi-JA (2011b) On the calculation of price sensitivities with jump-diffusion structure. MPRA Paper 30596. University Library of Munich, Germany

7 El-Khatib Y, Privault N (2004) Computations of greeks in a market with jumps via the Malliavin calculus. Finance Stoch 8(2):161–179

8 Forbes KJ, Rigobon R (2002) No contagion, only interdependence: measuring stock market co-movements. J Finance 57:2223–2261

9 Fournié E, Lasry JM, Lebuchoux J, Lions PL, Touzi N (1999) Applications of Malliavin calculus to Monte Carlo methods in finance. Finance Stoch 3(4):391–412

10 Hatemi-J A, Hacker S (2005) An alternative method to test for contagion with an application to the Asian financial crisis. Appl Financ Econ Lett 1(6):343–347

11 Lillo F, Mantenga F (2003) Power-law relaxation in a complex system: Omori law after a financial market crash. Phys Rev E 016119

12 McCauley J (2004) The dynamics of markets: econophysics and finance. Cambridge University Press, Cambridge

13 Nualart D (1995) The Malliavin calculus and related topics. Springer, Berlin

14 Oksendal B (1996) An introduction to malliavin calculus with applications to economics. Working paper 3, Institute of finance and management science, Norwegian school of economics and business administration

15 Savit R (1989) Nonlinearities and chaotic effects in options prices. J Futures Mark 9(6):507–518

16 Sornette D (2003) Why stock markets crash: critical events in complex financial markets. Princeton University Press, Princeton, NJ

17 Tvedt J (1998) Valuation of European futures options in the bifex market. J Futures Mark 18:167–175

Author information

Authors and Affiliations

Department of Mathematical Sciences, UAE University, Al-Ain, 17551, United Arab Emirates

Youssef El-Khatib

Department of Economics and Finance, UAE University, Al-Ain, 17555, United Arab Emirates

Abdulnasser Hatemi-J

Corresponding author

Correspondence to Youssef El-Khatib.

Editor information

Editors and Affiliations

International Association of Engineers, Unit 1, 1/F, 37-39 Hung To Road, Hong Kong, China

Sio-Iong Ao

School of Engineering, Applied Mathematics and Computing, Cranfield University, College Road, Cranfield, MK43 0AL, Bedfordshire, United Kingdom

Len Gelman

Rights and permissions

Reprints and permissions

Copyright information

© 2013 Springer Science+Business Media, LLC

About this chapter

Cite this chapter

El-Khatib, Y., Hatemi-J, A. (2013). Computations of Price Sensitivities After a Financial Market Crash. In: Ao, SI., Gelman, L. (eds) Electrical Engineering and Intelligent Systems. Lecture Notes in Electrical Engineering, vol 130. Springer, New York, NY. https://doi.org/10.1007/978-1-4614-2317-1_20

.RIS .ENW .BIB

DOI	Published	Publisher Name
https://doi.org/10.1007/978-1-4614-2317-1_20	02 May 2012	Springer, New York, NY
Print ISBN	**Online ISBN**	**eBook Packages**
978-1-4614-2316-4	978-1-4614-2317-1	Engineering Engineering (R0)

Keywords

Financial Crisis | Option Price | Call Option | Hedging Strategy | Price Sensitivity

These keywords were added by machine and not by the authors. This process is experimental and the keywords may be updated as the learning algorithm improves.

Publish with us

Policies and ethics

Profiles

1. Youssef El-Khatib

View author profile

Search

Search by keyword or author

Navigation

Find a journal

Publish with us

Track your research